

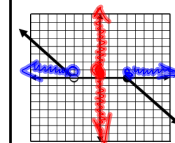
1) $(a^3b^2c^{-3})^2(a^{-4}bc^3)$
 $(a^6b^4c^{-6})(a^{-4}bc^3)$
 $a^2b^5c^{-3}$

2) $\left[\frac{(x^{-5}y^3)^2}{(x^4y^2c^{-1})^3} \right]^{-2}$
 $\frac{x^{10}y^6}{x^{12}y^6c^{-3}}$
 $\frac{x^{10}y^6}{x^{12}y^6c^{-3}}$
 $\frac{1}{x^2c^{-3}}$
 $\frac{1}{x^2c^{-3}}$
 $\frac{1}{x^2c^{-3}}$

Evaluate each expression showing all work.

- $\frac{14-A^2}{(4-2)} + 3^4 + 3$
 $\frac{14-16}{2} + 81 + 3$
 $\frac{-2}{2} + 81 + 3$
 $-1 + 81 + 3$
 83
- $-2 + [18 \div (9 - 2 \cdot 3)]$
 $-2 + [18 \div 3]$
 $-2 + 6$
 4
- $\frac{1}{2}(80 \div 8) + 2^3 - 4 \times 2$
 $\frac{1}{2}(10) + 8 - 8$
 $5 + 8 - 8$
 5
- $8 - 2 \cdot 3 + 3$
 $8 - 6 + 3$
 $2 + 3$
 5
- $\frac{(x^3y^2z)^2}{xy^2z^3} \cdot \frac{y^7}{x^7z^2}$
 $\frac{x^6y^4z^2}{xy^2z^3} \cdot \frac{y^7}{x^7z^2}$
 $\frac{x^5y^2z^2}{x^6y^2z^3} \cdot \frac{y^7}{x^7z^2}$
 $\frac{1}{x} \cdot \frac{y^9}{z}$
 $\frac{y^9}{xz}$
- $(a^{10}b^4c^{-12})^0$
 1
- $\left(\frac{3}{2}\right)^{-2} \cdot \left(\frac{8}{9}\right)^{-1}$
 $\left(\frac{2}{3}\right)^2 \cdot \frac{9}{8}$
 $\frac{4}{9} \cdot \frac{9}{8}$
 $\frac{1}{2}$
- $\left(\frac{1}{216}\right)^{-\frac{2}{3}}$
 $\left(\frac{1}{216}\right)^{-\frac{2}{3}}$
 $\left(\frac{1}{6^3}\right)^{-\frac{2}{3}}$
 $\left(\frac{1}{6}\right)^{-2}$
 6^2
 36

State if the following relation is a function. Then find the domain and range.



9. FUNCTION? Y or N
 (circle one)

10. Domain: $[-3, 25]$

11. Range: $(-\infty, \infty)$

12. FUNCTION? Y or N
 (circle one)

13. Domain: $(-\infty, \infty)$

14. Range: $[3, \infty)$

Determine the following using the given functions.
 $f(x) = x^2 - 1$ and $g(x) = 2x - 3$

15. $f + g$
 $(x^2 - 1) + (2x - 3)$
 $x^2 - 1 + 2x - 3$
 $x^2 + 2x - 4$

16. $f \cdot g$
 $(x^2 - 1)(2x - 3)$
 $2x^3 - 3x^2 - 2x + 3$

17. $f(g(x))$
 $f(2x - 3)$
 $(2x - 3)^2 - 1$
 $4x^2 - 12x + 9 - 1$
 $4x^2 - 12x + 8$

18. $g(f(x))$
 $g(x^2 - 1)$
 $2(x^2 - 1) - 3$
 $2x^2 - 2 - 3$
 $2x^2 - 5$

19. Find $g^{-1}(x)$
 $y = 2x - 3$
 $x = \frac{y + 3}{2}$
 $\frac{y + 3}{2} = x$
 $g^{-1}(x) = \frac{x + 3}{2}$

20. Find $f^{-1}(x)$
 $y = x^2 - 1$
 $x = \sqrt{y + 1}$
 $\sqrt{y + 1} = x$
 $f^{-1}(x) = \sqrt{x + 1}$

Graph the following. Be sure to label the vertex.

21. $f(x) = -\frac{1}{2}x^2 + 3$
 $h = 0, k = 3$

22. $f(x) = |x + 3| - 4$
 $h = -3, k = -4$

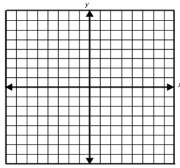
23. $f(x) = -|x + 4| + 2$
 $h = -4, k = 2$

24. $f(x) = \frac{3}{2}|x - 1| - 2$
 $h = 1, k = -2$

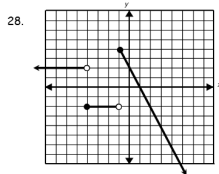
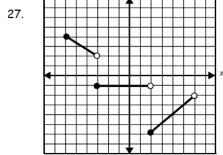
Graph the following piecewise function.

25. $f(x) = \begin{cases} -\frac{1}{2}x + 2 & \text{if } x \leq -2 \\ x + 1 & \text{if } -2 < x \leq 3 \\ 6 & \text{if } x > 3 \end{cases}$

$$26. f(x) = \begin{cases} x-4 & \text{if } x \leq 6 \\ -\frac{1}{2}x+3 & \text{if } x > 6 \end{cases}$$



Write the equations of the functions graphed below.



Identify each transformation from the parent function to the given $f(x)$.

29. $f(x) = \frac{1}{2}|x-3|+2$ *vertical compression by a factor of 1/2; shift 3 units right; shift 2 units up*
30. $f(x) = -2|x|+2$ *reflection over x-axis; vertical stretch by a factor of 2; shift 2 units up*
31. $f(x) = |x-4|-6$ *shift right 4 units; shift down 6 units*

Write the function for each graph described below.

32. the graph of $f(x) = |x|$ translated 10 units to the left and 3 units up and reflected over the x-axis.

$$f(x) = -|x+10|+3$$

33. the graph of $f(x) = |x|$ vertically stretched by a factor of 2, and translated 8 units to the right.

$$f(x) = 2|x-8|$$

34. the graph of $f(x) = |x|$ vertically compressed by a factor of $\frac{1}{4}$, reflected over the x-axis and translated 4 units down.

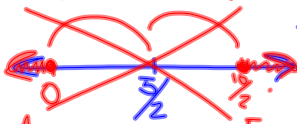
$$f(x) = -\frac{1}{4}|x|-4$$

$$|2x-5| \geq 5$$

$$|k-\frac{5}{2}| = \frac{5}{2}$$

$$k - \frac{5}{2} = 0$$

$$k = \frac{5}{2}$$



A: $(-\infty, \frac{5}{2}]$ B: $[\frac{5}{2}, 5)$

$$f(x) = x^2 + 1 \quad g(x) = 2x - 1$$

$$(f \circ g)(x) = f(g(x))$$

$$(2x-1)^2 + 1$$

$$(2x-1)(2x-1) + 1$$

$$4x^2 - 2x - 2x + 1 + 1$$

$$4x^2 - 4x + 2$$

$$(64)^{\frac{2}{3}}$$

$$\left(\frac{1}{64}\right)^{\frac{2}{3}} = \left(\left(\frac{1}{64}\right)^{\frac{1}{3}}\right)^2 = \left(\frac{1}{4}\right)^2 = \left(\frac{1}{4}\right)^2$$

$$\boxed{\frac{1}{16}}$$

$$\left(\frac{4}{3}\right)^{\frac{3}{2}} = \left(\frac{8}{4}\right)^{\frac{3}{2}} = \boxed{\frac{27}{64}}$$

$$S(x) = 4x - 1$$

$$\begin{array}{r} y = 4x - 1 \\ x = \frac{y+1}{4} \end{array}$$

$$\frac{x+1}{4} = \frac{y+1}{4}$$

$$y = \frac{x+1}{4}$$

$$S^{-1}(x) = \frac{x+1}{4}$$